masses of æolian rocks which had been thrown up along the slope of the cay about 80 feet from high-water mark to a height of 20 feet. One of these masses was 15′ 6″ × 11″ × 6′. We then kept on to Great Stirrup Cay coasting along the Berry Cays, crossed over to Morgan's Bluff, on eastward of Andros down to Mastic Point on the same Sound, and then returned to Nassau.

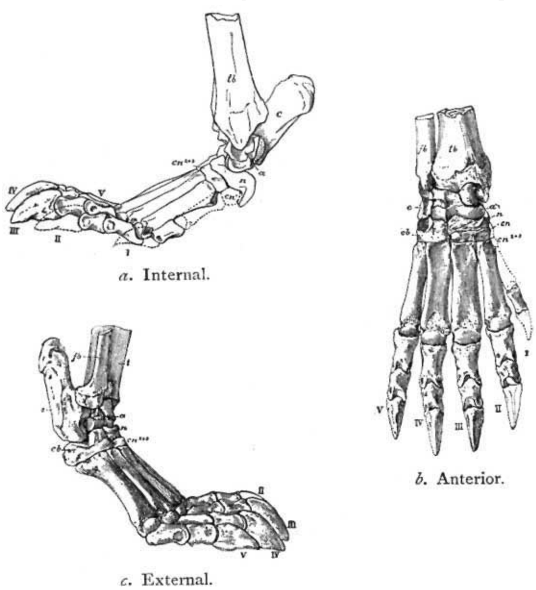
The islands of the Bahamas (as far as Turks Island) are all of æolian origin. They were formed at a time when the Banks up to the 10-fathom line must have been practically one huge irregularly shaped mass of low land, from the beaches of which successive ranges of low hills, such as we still find in New Providence, must have originated. After the islands were thus raised there was an extensive gradual subsidence which can be estimated at about 300 feet, and during this subsidence the sea has little by little eaten away the æolian lands, leaving only here and there narrow strips of land in the shape of the present islands. Inagua and Little Inagua are still in the original condition in which I imagine such banks as the Crooked Island Banks, Caicos Banks, and other parts of the Bahamas to have been; while the process of disintegration going on at the western side of Andros shows still a broad island which will in time leave only the narrow eastern strip of higher land (æolian hills) on the western edge of the tongue of the ocean. Such is the structure also of Salt Cay Bank which owes its present shape to the same conditions as those which have given the Bahamas their present configuration. My reason for assigning a subsidence of 300 feet is the depth of some of the deep holes which have been surveyed on the bank and which I take to be submarine blow-holes or caverns formed in the æolian limestone of the Bahama hills when they were at a greater elevation than now. This subsidence explains satisfactorily the cause of the present configuration of the Bahamas, but teaches us nothing in regard to the substratum upon which the Bahamas were built. The present reefs form indeed but an insignificant part of the topography of the islands and have taken only a secondary part in filling here and there a bight or a cove with more modern reef rock, thrown up against the shores so as to form a coral reef beach such as we find in the Florida Reef. I have steamed now nearly 3300 miles among the Bahamas, visiting all the more important points and have made an extensive collection of the rocks of the group.

I hoped to have made also a larger number of deep soundings than I have been able to take; unfortunately the trades were unusually heavy during the greater part of my visit to the Bahamas, greatly interfering with such work on a vessel no larger than the *Wild Duck*—127 feet on the water line. For the same reason the number of deep-water pelagic hauls was also much smaller than I hoped to make, as in a heavy sea the apparatus would have been greatly endangered. It is a very different thing to work at sea in a small yacht like the *Wild Duck* or in such vessels as the *Blake* and the *Albatross* of large size and fitted up with every possible requirement for deep sea work. The *Wild Duck*, on the other hand, was admirably adapted for cruising on the Bahama Banks, her light draught enabling her to go to every point of interest and to cross and recross the banks where a larger vessel could not follow. I am under the greatest obligations to my friend Mr. John M. Forbes for having so kindly placed his yacht at my disposal for this exploration, and I hope soon after my return to Cambridge to publish more in detail the results of this examination of the structure of the Bahamas.

ARTIONYX—A CLAWED ARTIODACTYLE.

If any further evidence were needed to disprove Cuvier's famous generalisation, it is found in the recently discovered hind foot of Artionyx. In this foot each of the digits with all the phalanges are modified very much as in the primitive bears, and combined with metatarsals and an ankle joint almost identical with those of the pigs. The termination of the limb in claws would have led Cuvier to predict that the whole skeleton and the dentition was of a clawed or carnivorous type, whereas in this animal we find the foot alone belongs to two types as widely separated as can be, and the probabilities are that the skeleton and teeth are also mixed in character.

The foot of Artionyx was found last summer by the American Museum party under Dr. Wortman, in the same beds with the remarkable Protoceras recently described in NATURE. It belonged to an animal about the size of a peccary. The terminal claws were first exposed, and although found uncleft, they at once suggested a reference to Chalicotherium, for which the party was keeping a sharp look-out; but a further removal of the matrix showed a pes of an entirely distinct character. In the foot of *Chalicotherium magnum* of the Upper Miocene of France we find three toes, thus odd in number, but not strictly perissodactyle, for the largest is not the median but the outer toe. Above the toes is an ankle joint of a modified perissodactyle type, that is, the astragalus is grooved upon its tibial side, and flattened where it rests upon the navicular. The navicular and cuneiforms are also flattened, so that the foot must have been placed somewhat at an angle with the leg, as it is in the Sloths. In Artionyx, on the other hand, there are five digits; the first, or thumb, was a dew-claw, very much shorter than the rest; the remaining four, as shown in *b* of the figure, are nearly symmetrically placed in pairs on either side of the median line, precisely as in the Artiodactyla. This has suggested the name of the animal, its even-numbered toes terminating in claws. Above these elements we have a coalescence of the outer and middle cuneiforms as in many Artiodactyla. The cuboid, navicular, astragalus, and calcaneum, are also modified precisely as in the artiodactyles. The fibula comes down upon the heel bone, and there is the characteristic double hinge. The tibia is strongly interlocked on the outer side of the astragalus. The three accompanying cuts exhibit the peculiar features of this foot; the side views showing that the animal was digitigrade like the cats, and not plantigrade like the bears, although the claws were more of the bear than the cat type.



a. Internal.

b. Anterior.

c. External.

Right hind foot of *Artionyx gaudryi*.

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The discovery of this foot is one of those complete surprises which render palæontological research so fascinating. The existence of such a type was not even suspected, for nothing at all similar has ever been found before. We were daily expecting to find remains of Chalicotherium in the Lower Miocene of America, but no one could have anticipated the complete counterpart in foot structure which this animal exhibits. Of course it will remain an open question whether Artionyx is actually related to the other type until we procure more of its skeleton, and especially of its teeth. This discovery seems to support Cope's opinion that Chalicotherium represents a distinct order—the Ancylopoda, including animals of an ungulate type of skeleton, with unguiculate phalanges. The writer has recently suggested that this order may have been given off from the most primitive hoofed mammals, the Condylarthra, at a period when they still exhibited many of the characters of their clawed ancestors. If this supposition is correct, and Artionyx proves to be a member of the Ancylopoda, it will very possibly present a unique double parallelism with the subdivisions of the Ungulata, Chalicotherium representing an odd-clawed division—the Perissonychia, and Artionyx an even-clawed division—the Artionychia—these divisions being parallel with the perissodactyle and artiodactyle ungulates. This is advanced as a provisional hypothesis, pending the discovery of additional remains. Henry F. Osborn.

THE HODGKINS FUND PRIZES.

In October, 1891, Thomas George Hodgkins, Esq., of Setauket, New York, made a donation to the Smithsonian Institution, the income from a part of which was to be devoted "to the increase and diffusion of more exact knowledge in regard to the nature and properties of atmospheric air in connection with the welfare of man."

With the intent of furthering the donor's wishes, the Smithsonian Institution now announces the following prizes to be awarded on or after July 1, 1894, should satisfactory papers be offered in competition:—

1. A prize of 10,000 dollars for a treatise embodying some new and important discovery in regard to the nature or properties of atmospheric air. These properties may be considered in their bearing upon any or all of the sciences—*e.g.* not only in regard to meteorology, but in connection with hygiene, or with any department whatever of biological or physical knowledge.

2. A prize of 2000 dollars for the most satisfactory essay upon (A) the known properties of atmospheric air considered in their relationships to research in every department of natural science, and the importance of a study of the atmosphere considered in view of these relationships; (B) the proper direction of future research in connection with the imperfections of our knowledge of atmospheric air, and of the connections of that knowledge with other sciences. The essay, as a whole, should tend to indicate the path best calculated to lead to worthy results in connection with the future administration of the Hodgkins foundation.

3. A prize of 1000 dollars for the best popular treatise upon atmospheric air, its properties and relationships (including those to hygiene, physical and mental). This essay need not exceed 20,000 words in length; it should be written in simple language, and be suitable for publication for popular instruction.

4. A medal will be established, under the name of "The Hodgkins Medal of the Smithsonian Institution," which will be awarded annually or biennially, for important contributions to our knowledge of the nature and properties of atmospheric air, or for practical applications of our existing knowledge of them to the welfare of mankind. This medal will be of gold, and will be accompanied by a duplicate impression in silver or bronze.

The treatises may be written in English, French, German, or Italian, and should be sent to the secretary of the Smithsonian Institution, Washington, before July 1, 1894, except those in competition for the first prize, the sending of which may be delayed until December 31, 1894.

The papers will be examined and prizes awarded by a committee to be appointed as follows:—One member by the secretary of the Smithsonian Institution, one member by the President of the National Academy of Sciences, one by the President *pro tempore* of the American Association for the Advancement of Science, and the committee will act together with the Secretary of the Smithsonian Institution as member *ex officio*. The right is reserved to award no prize if, in the judgment of the committee, no contribution is offered of sufficient merit to warrant an award. An advisory committee of not more than three European men of science may be added at the discretion of the Committee of Award.

If no disposition be made of the first prize at the time now announced, the Institution may continue it until a later date, should it be made evident that important investigations relative to its object are in progress, the results of which it is intended to offer in competition for the prize. The Smithsonian Institution reserves the right to limit or modify the conditions for this prize after December 1, 1894, should it be found necessary. Should any of the minor prizes not be awarded to papers sent in before July 1, 1894, the said prizes will be withdrawn from competition.

A principal motive for offering these prizes is to call attention to the Hodgkins Fund and the purposes for which it exists, and accordingly this circular is sent to the principal universities and to all learned societies known to the Institution, as well as to representative men of science in every nation. Suggestions and recommendations in regard to the most effective application of this fund are invited.

It is probable that special grants of money may be made to specialists engaged in original investigation upon atmospheric air and its properties. Applications for grants of this nature should have the indorsement of some recognised academy of sciences or other institution of learning, and should be accompanied by evidences of the capacity of the applicant in the form of at least one memoir already published by him based upon original investigation.

To prevent misapprehension of the founder's wishes it is repeated that the discoveries or applications proper to be brought to the consideration of the Committee of Award may be in the field of any science or any art without restriction, provided only that they have to do with "the nature and properties of atmospheric air in connection with the welfare of man."

Information of any kind desired by persons intending to become competitors will be furnished on application.

All communications in regard to the Hodgkins Fund, the Hodgkins Prizes, the Hodgkins Medals, and the Hodgkins Fund Publications, or applications for grants of money, should be addressed to S. P. Langley, Secretary of the Smithsonian Institution, Washington, U.S.A.

S. P. Langley,
Secretary of the Smithsonian Institution.
Washington, March 31, 1893.

THE SOLAR ECLIPSE.

The telegrams relating to the total solar eclipse of April 16 indicate that the observations at the various centres were carried on under very favourable conditions. The Senegal party—which will be home next week—was

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